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Attorneys for Plaintiff
ALEKSANDAR KAVCIC, PH.D.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

ALEKSANDAR KAVCIC, PH.D., Plaintiff, v. BROADCOM CORPORATION, Defendant.	Case No. 20-cv-01246-MMC **VERIFIED COMPLAINT FOR DECLARATORY JUDGMENT**

The Plaintiff, ALEKSANDAR KAVCIC, PH.D. ("Dr. Kavcic"), for his Complaint against the Defendant, BROADCOM CORPORATION ("BROAD COM"), states:

NATURE OF THE ACTION

1. This action seeks a declaration affirming the right of Plaintiff Aleksandar Kavcic, Ph.D. to participate in the defense of the validity of his own invention and patent -- detector technology for disk drives.

2. In the early 2000s, Dr. Kavcic (and his co-inventor, Professor Jose Maura), invented detector technology that permitted large increases in the storage space of data on disk drives. The detector technology was thereafter patented ("the Detector Patents," as hereinafter described).

3. At about the same time, the University of Minnesota patented coding technology for disk drives ("The Coding Patent," as hereinafter described).

4. Aware of Dr. Kavcic's reputation in the electronics industry and his expertise in disk drive technology in general, BROADCOM engaged Dr. Kavcic in [redacted]

5. In July 2018, Carnegie Mellon University, the assignee of the Detector Patents, sued BROADCOM for infringing Dr. Kavcic's detector patents.

6. Dr. Kavcic, as the inventor of the technology, consulted with Carnegie Mellon University to defend BROADCOM's attack on the validity of the Detector Patents, until BROADCOM threatened him with litigation for allegedly violating the Letter Agreement relating to the Coding Patent.

7. The coding and detector patents are separate and distinct technologies that affect different parts of read channel design on disk drives. Nothing in the Letter Agreement prohibits Dr. Kavcic from consulting on the detector technology he invented. Yet, without a declaration affirming these rights, Dr. Kavcic will be precluded from defending the validity of his invention and, if the Detector Patents are found invalid or not infringed as a result of his inability to assist in the

litigation of those patents, he will not receive a share of royalties for the infringement of those patents and will suffer damages of at least $75,000.

THE PARTIES

8. Dr. Kavcic is an individual residing in Austin, Texas and is therefore a resident of the State of Texas.

9. BROADCOM is a corporation organized under the laws of the State of Delaware and having a principal place at 1320 Ridder Park Drive, San Jose, California. BROADCOM is therefore a resident of the State of California.

JURISDICTION AND VENUE

10. This lawsuit is a civil action arising under the Declaratory Judgments Act, 28 U.S.C. § 2201. The parties are citizens of different states and the amount in controversy is over $75,000. This Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. § 1332.

11. This Court has personal jurisdiction over BROADCOM because BROADCOM is headquartered in and regularly conduct business in the State of California and in this judicial district. As a result, BROADCOM has intentionally availed itself of the privilege of conducting business in California and in this judicial district and can reasonably and fairly anticipate being haled into this Court.

12. BROADCOM has a regular and established place of business in this district and therefore resides in this district. Additionally, a substantial part of the events or omissions giving rise to this lawsuit occurred in this district. Accordingly, venue is proper in this district under 28 U.S.C. § 1391(b)(1) and (2).

COMMON ALLEGATIONS

Dr. Aleksandar Kavcic

13. Dr. Kavcic received a dipl.ing degree (an advanced academic degree) in electrical engineering from Ruhr University in Bochum, Germany. He received a Doctor of Philosophy degree in electrical engineering and computer engineering

from Carnegie Mellon University ("CMU"), in Pittsburg, Pennsylvania. He has served as a faculty member at CMU, at Harvard University, and at University of Hawai'i. He has been a visiting scholar at City University of Hong Kong and the Chinese University of Hong Kong.

14. Dr. Kavcic, while at CMU, began research in signal processing and magnetics. In the early 1980s, the use of magnetic disks, also called "disk drives," became common as the desktop and laptop computer industry expanded. Disk drives have a very thin magnetic layer applied to a glass, metal, or plastic disk. Closely-spaced electrical impulses are written on the magnetic layer. These impulses are the data stored on the disk. Initially, the computer industry could not read densely-written data on disk drives without unacceptably high readback error rates. Accordingly, early disk drives had low-density data, limiting the amount of data that could be stored on a disk.

15. Dr. Kavcic, in the course of his research leading to his doctorate in electrical engineering, discovered, along with his faculty mentor, Professor Jose Maura, a novel method of detecting the data on disk drives.

The Detector Patent Technology

16. Dr. Kavcic's method allowed data to be densely packed, thereby allowing for far greater storage capacity on disk drives. The detectors and the method of detection invented by Dr. Kavcic and Professor Maura were significant improvements over existing detectors and methods and allowed manufacturers to make computers with much larger capacity on much smaller drives, which allowed consumers to purchase and use smaller devices with larger capacities.

17. CMU applied for patent protection for the invention. Dr. Kavcic and his co-inventor, Professor José F. Moura, assigned their rights in the invention to CMU. In the Assignment, a copy of which is attached as Exhibit A, Dr. Kavcic (and Professor Moura) agreed as follows:

> "ASSIGNOR further covenants that ASSIGNEE will, upon its request, be provided with all pertinent facts and documents relating to said Invention and said Letters Patent and legal equivalents as may be known and accessible to ASSIGNOR and will testify to the same in any interference, litigation or proceeding related thereto and will promptly execute and deliver to ASSIGNEE or its legal representatives any and all papers, instruments or affidavits required to apply for, obtain, maintain, issue and enforce said application, said invention and said Letters Patent and said equivalents thereof which may be necessary or desirable to carry out the purposes thereof."

18. The application resulted in the United States Patent and Trademark Office granting the following patents ("the Detector Patents"):

a. United States Patent No. 6,201,839, *Method and Apparatus for Correlation-Sensitive Adaptive Sequence Detection*; and

b. United States Patent No. 6,438,180, *Soft and Hard Sequence Detection in ISI Memory Channels*.

19. These patents were described by the United States Court of Appeals for the Federal Circuit as follows:

> "[T]he patents claim an improvement over existing detectors by teaching use of branch metric functions that are specifically adapted to reduce the effects of the most likely errors caused by the ever smaller magnetic regions used for storing data on hard disks. Specifically, the patents teach that (1) different functions may be used for different branches, depending, in particular, on the measured signal samples, and (2) each branch metric function can take as its input a plurality of adjacent signal samples, rather than a single sample. The former addresses signal-dependent noise, the latter correlated noise." *Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd.*, 807 F.3d 1283, 1290-91 (Fed. Cir. 2015).

20. Dr. Kavcic and Professor Maura are named inventors on the Detector Patents. Pursuant to their employment contracts with CMU, each of them is entitled to 10 percent of the proceeds of these patents.

21. In 2009, CMU sued Marvell Technology for infringement of the Detector Patents.

22. At the time, Marvell Technology had a market share of approximately 60 percent of the computer disk drive business. LSI Corporation had a market share of approximately 40 percent.

23. A judgment in favor of CMU finding the Detector Patents to be valid and infringed was affirmed by the Federal Circuit (in the opinion quoted above). The matter was returned to the district court for a re-calculation of damages. The parties thereafter settled, in about February of 2016, for an amount publicly reported as $750,000,000.

The Coding Patent Litigation

24. In August of 2016, the University of Minnesota ("UM") sued LSI Corporation and Avago Technologies U.S. Inc. in Civil Action No. 16-cv-02891, in the United States District Court for the District of Minnesota, alleging infringement of the Coding Patent, United States Patent No. 5,859,601, *Method and Apparatus for Implementing Maximum Transition Run Codes*. (The case was transferred in 2018 to the Northern District of California.)

25. On information and belief, Avago Technologies is a predecessor company to BROADCOM.

26. On information and belief, LSI is or was owned by BROADCOM.

27. The UM lawsuit describes the Coding Patent as "a method for ***encoding*** data to be written to a magnetic disk in a hard disk drive ("HDD") that increases the accuracy with which the data are subsequently read off of those magnetic disks, thereby substantially improving the performance of the HDD and allowing for increased data density." *See* Civil Action No. 16-cv-02891, ¶ 2 (emphasis added).

28. Further, the invention is said to "relate[] generally to a ***coding*** scheme for an HDD, … that improves the BER of sequence detectors in the read channels of an HDD by "eliminat[ing] certain error-prone data patterns from the allowable set of input patterns that are to be recorded" on the disks of the HDD." *Id*., ¶ 47 (emphasis added).

29. Throughout the lawsuit, the Coding Patent is described as relating to

the construction of codes and claims an apparatus "for encoding" and a method "for encoding."

[redacted]

30. Dr. Kavcic, by the time of the UM lawsuit, was well-known in the electronics industry. He received the IBM Partnership Award in 1999 and the NSF Career Award in 2000. He served on the Editorial Board of the IEEE Transactions on Information Theory as Associate Editor for Detection and Estimation from 2001 to 2004. He served as the Chair of the Signal Processing for Storage Technical Committee of the IEEE Communications Society from 2005 to 2007. He is a named inventor on seven United States patents issued prior to November of 2016.

31. Dr. Kavcic, at this time, was also particularly well-known to LSI, one of the defendants in that lawsuit. LSI sponsored Dr. Kavcic's research on detectors for flash memories when he taught at University of Hawai'i, prior to November of 2016. Dr. Kavcic was also well-known at LSI before November of 2016 because of his relationships with his former student, Dr. Shaohua Yang, and Dr. Yang's supervisor, Dr. Yuanxing Lee, both employed at the time by LSI. Dr. Lee, in February of 2016, was a vice president of BROADCOM.

32. BROADCOM, knowing of Dr. Kavcic's expertise in electronics in general, and knowing of his invention of the detector technology patented in the Detector Patents, and knowing of his involvement in the lawsuit for infringement of the Detector Patents, engaged Dr. Kavcic in November of 2016 for consultation [redacted]. Dr. Kavcic and Broadcom thereafter entered into a Letter Agreement, a copy of which is attached under seal as **Exhibit B**, in November of 2016.

33. BROADCOM knew in November of 2016 that Dr. Kavcic was the inventor of the detectors claimed in the Detector Patents owned by CMU. The *CMU v. Marvell* case, which lasted over six years, was reported extensively by the

media and was widely known in the disk drive industry. BROADCOM, along with other entities, filed an amicus curiae brief supporting Marvell. Dr. Kavcic's name appears 24 times in the Federal Circuit's opinion cited above (dated in 2015).

34. LSI and BROADCOM knew or should have known that CMU, having settled its litigation with the largest member of the disk drive industry, was likely to turn its attention to the second largest member of that industry.

[redacted]

36. The Letter Agreement restrains Dr. Kavcic from engaging in a lawful profession, trade, or business.

37. The Letter Agreement is not limited in time or geographic reach.

38. Dr. Kavcic did not receive any trade secret information from BROADCOM or any of its subsidiaries or affiliates under the Letter Agreement.

[redacted]. He did not receive any LSI or BROADCOM information, confidential or otherwise, did not request any LSI or BROADCOM confidential information, and has not seen or reviewed or otherwise had access to any LSI or BROADCOM confidential information.

[redacted]

[redacted]

42. Dr. Kavcic did not agree in the Letter Agreement (or elsewhere) to refrain from assisting another party seeking to license intellectual property rights associated with other technology. In particular, he did not agree to refrain from assisting in detector technology.

The Detector and Coding Technologies are Distinct

43. The Detector Patents are "other technology" from the Coding Patent.

44. A "read channel" is a circuit in a hard disk drive that encodes the data bits into flux changes for recording and decodes the magnetic flux changes into bits for reading. Construction of codes, as claimed in the Coding Patent, and construction of detectors, as claimed in the Detector Patents, are completely separate and distinct parts of read channel design. Detectors are considered part of signal processing, which is different from coding. This distinction is illustrated by the fact that different detectors can work with the same code and a particular detector can work with different codes. The choice of detector does not prevent a skilled engineer from choosing a particular code and the choice of code does not prevent that skilled engineer from choosing a particular detector. Detectors and codes are separate, distinct, and nonoverlapping segments of the read channel design in hard-disk drives.

The Detector Patent Litigation

45. In July 2018, CMU sued BROADCOM in the United States District Court for the Northern District of California, Civil Action No. 18-cv-04571 (the "Detector Patent Litigation"), alleging infringement of the Detector Patents. Dr. Kavcic, as an inventor named on the Detector Patents, has a financial interest in the Detector Patents and acts as a consultant to CMU on the litigation.

46. In October of 2019, counsel for LSI informed Dr. Kavcic and counsel for CMU that Dr. Kavcic was prohibited, by the Letter Agreement, from assisting in the litigation of his own patents.

47. Counsel for LSI asserted broadly that the Coding Patent related to "read channel design." This assertion is incorrect, as the Coding Patent relates only to the construction of codes for data storage.

48. Counsel for LSI threatened Dr. Kavcic with "legal action" by BROADCOM and insisted that Dr. Kavcic retain all records relating to his communications with CMU.

49. Counsel for LSI forced Dr. Kavcic to leave a deposition in the Detector Patent Litigation, claiming it was a breach of the Letter Agreement.

50. Without a declaration from this Court, Dr. Kavcic will suffer irreparable harm by being precluded from participating in legal proceedings relating to his own invention, the Detector Patent.

51. Additionally, CMU had intended to designate Dr. Kavcic in the Detector Patent Litigation to testify as a Rule 30(b)(6) witness on topics designated by the Defendant in that case. CMU, however, cannot do so because of Broadcom's threats to sue Dr. Kavcic, to the prejudice of CMU and, ultimately, to the prejudice of Dr. Kavcic.

52. CMU cannot adequately represent Dr. Kavcic's interests in the Detector Litigation because he has specialized knowledge of the technology. Dr. Kavcic is the inventor of the invention claimed in the patents that are the subject of the Detector Litigation. Insofar as Broadcom seeks to change claim construction terms, it must be understood that improperly construed claim construction terms may to invalidation. Broadcom may seek to use external experts to construe terms, and these experts need to be confronted by the expertise of the individual who actually wrote the patent so as to give them the true and precise meaning. If

Broadcom seeks to invalidate the patent using other technical arguments, without the expertise of the inventor, CMU will not be in the position to defend against these attempts in a manner true to the actual meaning and intent of the inventor.

COUNT I – DECLARATORY JUDGMENT OF NON-BREACH OF LETTER AGREEMENT

53. BROADCOM has accused Dr. Kavcic of breach of contract and has threatened litigation.

54. Dr. Kavcic's assistance on CMU's lawsuit alleging infringement of Dr. Kavcic's Detector Patents is not prohibited by the Letter Agreement and his assistance is therefore not breach of contract.

55. If Dr. Kavcic is unable to assist CMU with the lawsuit over his own patents, there is a reasonable likelihood that the recovery of damages will be diminished in total or in part, which will cause Dr. Kavcic a loss of over $75,000.

56. There is a substantial and continuing justiciable controversy between the parties as to Dr. Kavcic's non-breach of the Letter Agreement.

57. Dr. Kavcic is entitled to a declaration that he does not breach the Letter Agreement by assisting CMU in proving infringement and validity of Dr. Kavcic's own detector patents.

WHEREFORE, Plaintiff, Aleksandar Kavcic, prays that this Court declare the rights of the parties and that it enter judgment declaring that:

A. The Letter Agreement is unenforceable;

B. The Coding Patent describes and claims different "technology" than what is described and claimed in the Detector Patents, [redacted]

C. Dr. Kavcic has not breached the Letter Agreement.

/ / /

/ / /

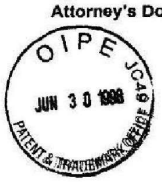
D. Dr. Kavcic's involvement as a consultant to CMU on litigation alleging infringement of Dr. Kavcic's Detector Patents does not breach the Letter Agreement;

Dated: February 13, 2020

CLARK HILL LLP

By: /s/Georges A. Haddad
Georges A. Haddad
Plaintiff ALEKSANDAR KAVCIC, PH.D.

Attorney's Docket No. 97168 PATENT



For: ☒ U.S. and/or ☒ Foreign Rights
For: ☒ U.S. Application or
☐ U.S. Provisional Application
For: ☐ U.S. Patent
For: ☐ PCT Application
By: Multiple Inventors

ASSIGNMENT OF INVENTION (MULTIPLE INVENTORS)

In consideration of the payment by ASSIGNEE to ASSIGNOR of the sum of One Dollar ($1.00), the receipt of which is hereby acknowledged, and for other good and valuable consideration,

ASSIGNORS (Inventors):

(type or print name of inventors)	Address	Nationality
Aleksandar Kavcic	5649 Phillips Avenue, Apt. 6 Pittsburgh, PA 15217	Yugoslavia
Jose M.F. Moura	6645 Woodwell Street Pittsburgh, PA 15217	Portugal

(Assignment of Invention–Multiple Inventors [16-3.2]–page 1 of 3)

CMU 00010160

DX-340-00092

EXHIBIT A

CMU_LSI_00034720

hereby sells, assigns and transfers to

ASSIGNEE:

Carnegie Mellon University (type or print name of ASSIGNEE) | 5000 Forbes Avenue Address

(a non-profit Pennsylvania organization) Nationality | Pittsburgh, PA 15213

and to its successors, assigns and legal representatives of the ASSIGNEE

(complete one of the following)

☒ the entire right, title and interest

☐ an undivided _____ percent (_____%) interest for the United States and its territorial possessions

(check the following box, if foreign rights are also to be assigned)

☒ and in all foreign countries, including all rights to claim priority, in and to any and all improvements which are disclosed in the invention entitled:
METHOD AND APPARATUS FOR CORRELATION-SENSITIVE ADAPATIVE SEQUENCE DETECTION
(check and complete (a), (b), (c), (d), (e), (f) or (g))

and which is found in

(a) ☐ U.S. patent application executed on even date herewith

(b) ☐ U.S. patent application executed on _____

(c) ☐ U.S. provisional application naming the above inventor(s) for the above-entitled invention

☐ Express mail label no.: _____

Mailed: _____

☐ To comply with 37 CFR 3.21 for recordal of this assignment, I, an ASSIGNOR signing below, hereby authorize and request my attorney to insert below the filing date and application number when they become known.

(d) ☒ U.S. application no. 09/055,003 ; filed on April 3, 1998

(e) ☐ International application no. PCT /_____/_____ filed on _____

(f) ☐ U.S. patent no. _____ issued _____

☐ A change of address to which correspondence is to be sent regarding patent maintenance fees is being sent separately.

(also check (g), if foreign application(s) is also being assigned)

(g) ☒ and any legal equivalent thereof in a foreign country, including the right to claim priority and, in and to, all Letters Patent to be obtained for said invention by the above application or any

continuation, division, renewal, or substitute thereof, and as to letters patent any reissue or re-examination thereof.

ASSIGNOR hereby covenants that no assignment, sale, agreement or encumbrance has been or will be made or entered into which would conflict with this assignment;

ASSIGNOR further covenants that ASSIGNEE will, upon its request, be provided promptly with all pertinent facts and documents relating to said invention and said Letters Patent and legal equivalents as may be known and accessible to ASSIGNOR and will testify as to the same in any interference, litigation or proceeding related thereto and will promptly execute and deliver to ASSIGNEE or its legal representatives any and all papers, instruments or affidavits required to apply for, obtain, maintain, issue and enforce said application, said invention and said Letters Patent and said equivalents thereof which may be necessary or desirable to carry out the purposes thereof.

IN WITNESS WHEREOF, We have hereunto set hand and seal this 6/17/98
Date of signing

WARNING: The date of signing must be the same as the date of execution of the application, if item (a) was checked above.

Aleksandar Kavcic (type name of Inventor)	Signature of INVENTOR
José M.F. Moura	

☐ Notarization or Legalization Page Added.

NOTE: No witnessing, notarization or legalization is necessary. If the assignment is notarized or legalized, then it will only be prima facie evidence of execution. 35 USC 261. Use next page if notarization is desired.

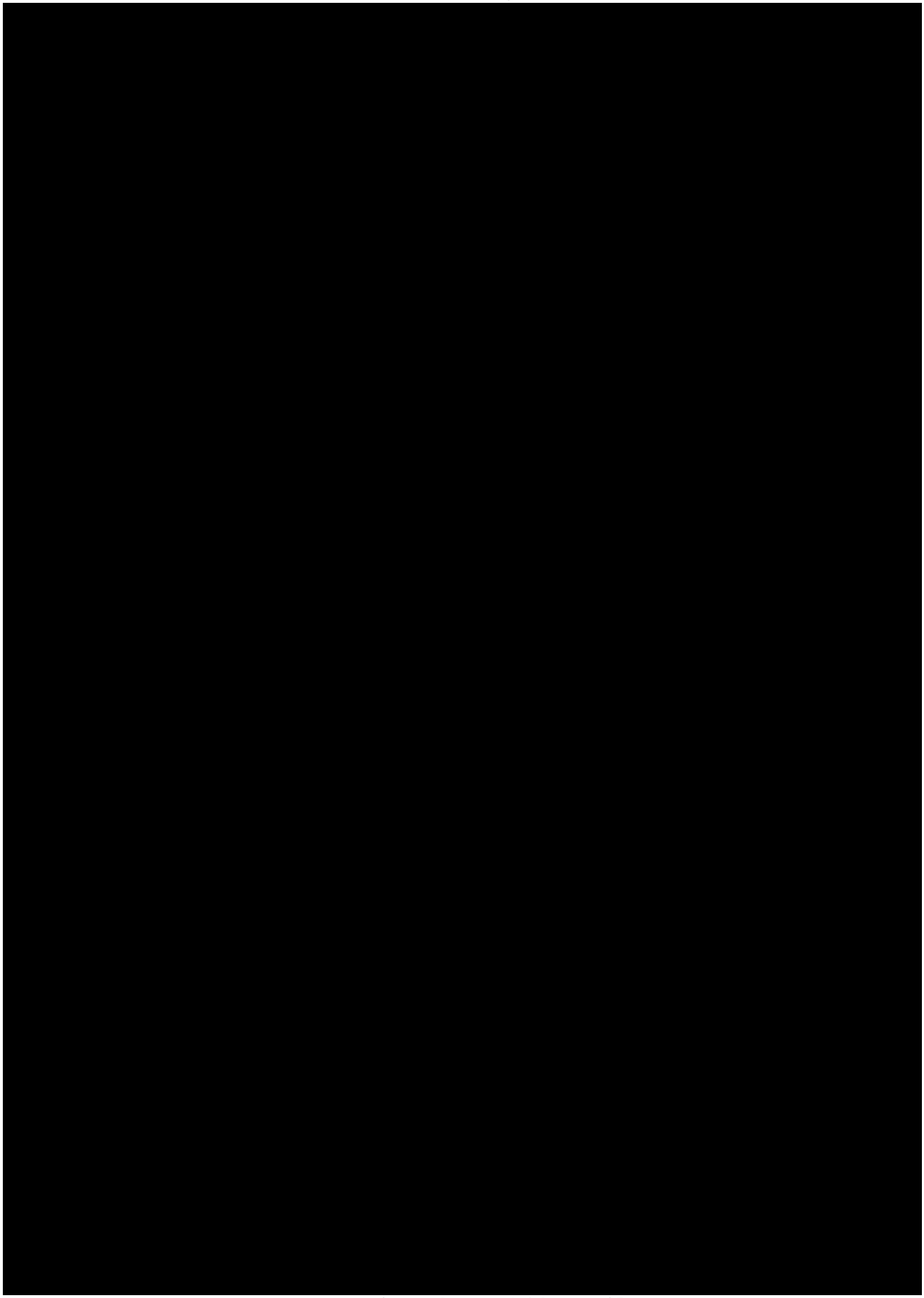


EXHIBIT B